# Conservative Management of a Grade 4 Renal Laceration in a Child

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*Renal trauma associated with blunt abdominal trauma is common. Children presenting with grade 4 or 5 renal lacerations who are hemodynamically stable can be followed safely nonoperatively. No long-term complications from conservative management have been noted.* [Rev Urol. *2001;3(1):40-41*]

**Key words:** Child • Computed tomography • Hematuria • Kidney • Wounds

We have many studies and reports in the literature to guide us in cases of renal trauma in adults, but the literature is rather limited regarding reports of renal trauma in children. Here, we review the management options for blunt renal injury in a child.

## Case Report

An otherwise healthy 8-year-old girl was playing with a friend and fell from a top bunk bed onto a wooden bed rail. She complained of mild, left lower abdominal pain, but her parents did not seek medical advice immediately. The next morning, about 12 hours after the accident, she had gross hematuria, at which point her parents brought her to the emergency department.

On physical examination, her vitals signs were: temperature, 38.3°C (100.9°F); heart rate, 125 beats per minute; blood pressure, 107/52 mm Hg; and respiratory rate, 30 breaths per minute. She was in no acute distress. Her abdomen was soft but diffusely tender to palpation. She had mild, left costovertebral-angle tenderness. No masses or bruising were noted. Her urine was light red. Laboratory examination indicated that the serum hematocrit was 32.9% and the serum creatinine level was 0.7 mg/dL. Urinalysis showed 200 red blood cells and 5 to 10 white blood cells per high-power field.

A CT scan of the abdomen and pelvis, with and without intravenous contrast, revealed a large, grade 4 left renal laceration (with questionable extravasation of contrast) and a large perirenal hematoma (Figure 1). The decision was made to follow the patient conservatively. She was admitted to the hospital and placed on bed rest, with total restriction of food and liquid. Serum hematocrit values were checked serially. Her initial hematocrit went from 32.9% to 28.6% 4 hours later. In another 4 hours, her hematocrit was stable at 27.9% and remained stable during her hospital stay. Hematuria resolved within several days. She was then taken off bed rest and food

and fluid restriction and was observed in the hospital. Her urine remained clear. She was discharged on day 10 of her hospital stay. Follow-up CT scans were obtained at approximately 2-month intervals to document the resolution of the hematoma (Figures 2 and 3) and function of the kidney.

## Discussion

Renal injuries occur in approximately 10% of all abdominal trauma.[1] About 90% of these injuries are the result of blunt trauma, but only 2% require surgical intervention.[2] In cases of blunt trauma, the kidney is the urologic organ most often injured. Most of the literature on renal trauma pertains to adults, and little has been written specifically about renal trauma in children.[3-5]

Levy and associates[3] reviewed 1175 pediatric patients in their trauma registry at Children's Hospital of Philadelphia who were treated between 1987 and 1991. They reported that only 5.2% of patients had gross or microscopic hematuria. Almost 14% of the patients with blunt abdominal trauma had major renal injuries. All patients were managed nonoperatively, with the exception of 1 patient who required a partial nephrectomy for continued hemorrhage. These investigators concluded that renal trauma should be managed nonoperatively, with surgery reserved for those with ongoing bleeding.

Smith and coworkers[4] reviewed 20 patients with grade 3 to 5 renal lacerations. All patients were initially managed nonoperatively. Only 2 patients required surgical exploration. All patients managed nonoperatively did well, and there were no long-term complications noted, including no evidence of delayed hypertension.

Carvajal Busslinger and Kaiser[5] reported on 74 pediatric patients with renal trauma and found that 55 were treated conservatively. The authors compared this group with patients who underwent surgery and noted that patients with trauma who were treated conservatively had shorter hospital stays with fewer complications.

Recently, Altman and colleagues[6] studied 13 adult patients with grade 5 renal lacerations. In comparing patients whose trauma was managed operatively or conservatively, these investigators found that those undergoing surgery had longer ICU stays and required more transfusions. They proposed that grade 5 renal lacerations be managed nonoperatively in patients who are hemodynamically stable.

It appears that the literature supports the notion of nonoperative management for pediatric patients with grade 4 or 5 renal lacerations who are hemodynamically stable. There are no current reports of long-term complications, such as hypertension. ■

### Main Points

- Only 2% of renal injuries resulting from blunt trauma require surgery.
- Grade 4 or 5 renal lacerations can be managed nonoperatively in children who are hemodynamically stable.
- There appear to be no long-term complications in children with grade 4 or 5 renal trauma that has been managed conservatively.

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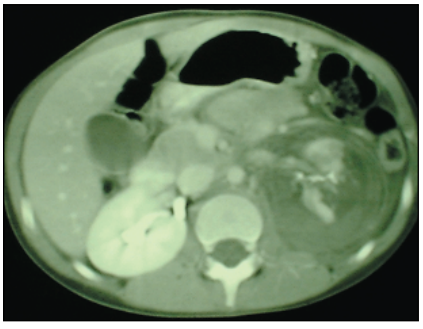

**Figure 1.** *The initial CT scan from the emergency department. A large left perirenal hematoma is noted with questionable extravasation of contrast material.*

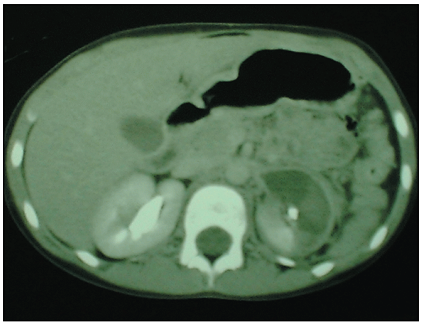

**Figure 2.** *A CT scan performed 2 months after the accident shows resolution of the perirenal hematoma. Areas of nonfunctioning parenchyma remain.*

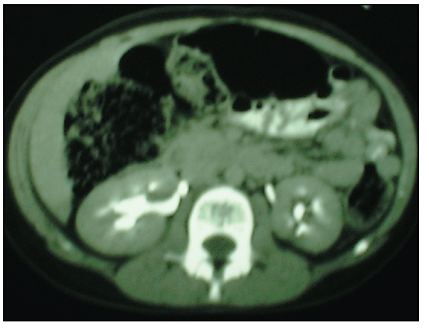

**Figure 3.** *A CT scan performed 4 months after the accident shows a relatively normal-appearing kidney with good function.*